DOCUMENT RESUME

ED 344 137 CG 024 130

AUTHOR Stickel, Sue A.
TITLE Chaos Theory: Implications for Nonlinear Dynamics in Counseling.
PUB DATE 5 Mar 92
NOTE 12p.; Paper presented at the Annual Meeting of the Eastern Educational Research Association (Hilton Head, SC, March 3-7, 1992).
PUB TYPE Reports - General (140) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Clinical Psychology; *Counseling Techniques; *Counseling Theories
IDENTIFIERS *Chaos Theory

ABSTRACT

The purpose of this paper is to explore the implications of chaos theory for counseling. The scientific notion of chaos refers to the tendency of dynamical, nonlinear systems toward irregular, sometimes unpredictable, yet deterministic behavior. Therapists, especially those working from a brief approach, have noted the importance of the client's situation upon entering therapy and that a single therapeutic session can promote substantial changes. The interest of chaos theory for the counselor may lie in its ability to provide metaphors for understanding the complexity of the client's life situation, among them sensitive dependence, turbulence, strange attractors, and iteration. Sensitive dependence on initial conditions is the notion that small variances multiply and later magnify to a point of crisis or chaos. Turbulence is a mess of disorder at all scales. Turbulence has implications for the conditions that bring clients to therapy. Entrance into therapy is thus not a random event, but usually occurs in the context of the complex interpersonal and developmental changes within and around an individual. The analogy to chaos is that therapy may begin in the process of the movement from smooth to turbulent flow. In phase space, all that is known about the state of a dynamical system at a single moment can be collapsed to a point. Phase space is composed of as many variables as needed to describe a system's movement. The chaos pattern or strange attractor is the shape of the map that results. Iteration is the simple repeating of a certain function using the previous output as input for the next operation; a feedback loop. A case presentation is used to illustrate the metaphors that chaos may provide for the process of counseling. (LLL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED344137

Chaos Theory: Implications for Nonlinear Dynamics in Counseling

Sue A. Stickel
Assistant Professor of Leadership and Counseling
Eastern Michigan University
Ypsilanti Michigan
(313) 487-0255

Paper presented at the annual meeting of the Eastern Educational Research Association, Hilton Head, SC. March 5, 1992

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Sue A. Stickel

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CG024130

BEST COPY AVAILABLE

Chaos Theory: Implications for Nonlinear Dynamics in Counseling

The scientific notion of chaos is gaining attention in fields as diverse as philosophy and weather science. Chaos refers to the tendency of dynamical, nonlinear systems toward irregular, sometimes unpredictable, yet deterministic behavior. Chaos theory thus deals with diversity, change, synthesis, and turbulence. Clients enter counseling with concerns that for the most part do not lend themselves to a linear formula. The intrigue of chaos theory for the counselor may lie in its ability to provide metaphors for understanding the complexity of the client's life situation. The purpose of this paper will be to explore the implications of chaos for counseling. A case presentation will be used as illustration.

Chaos suggests a stretching of boundaries in how outcomes, changes, and research perspectives are conceptualized. Sechrest, Ametrano and Ametrano (1983) noted that change is difficult to measure dependably and to analyze legitimately. Chronbach (1988) suggested that metaphors and mathematical analyses flow from the study of chaos and that metaphor will predominated for the next two decades. A possible response may then be to further legitimize a change from the orthodox "scientific" research perspective that attempts to predict and control to one that attempts to describe, appreciate, interpret, and explain social and individual behavior (Cziko, 1989). Lindsay (1991) in a discussion of the chaos pattern in Piaget, noted that Piaget had the right metaphor years ahead of colleagues and that scientists are now beginning to understand concepts that he had grasped intuitively.

Sensitive Dependence

Sensitive dependence on initial conditions is the notion that small variances multiply and later magnify to a point of crisis or chaos. Known as the "Butterfly Effect" (the flapping of a butterfly's wings in Brazil could cause tornados in Ohio), Gleick (1987) stated that this quality lurks everywhere. A person leaves the house 30 seconds late, escapes by millimeters a falling flowerpot and then is

run over by a truck. Thus small variations in the daily trajectory can have large consequences and minor disruptions in one part of a system can result in major changes in the system as a whole. Each starting point will generate a unique series of events.

Therapists, especially those working from a brief approach, have noted the importance of the client's situation upon entering therapy. Talmon (1990) advocates that a single therapeutic session can promote substantial changes. He became intrigued by his study of the pattern of practice of some thirty therapists. The modal length of therapy was a single session and 30% of the clients chose to come for only one session in a period of a year. As a result of further study he saw a need for alternatives to the notion that serious therapy and lasting change can only be achieved by a lengthy therapeutic process. He began to look for the smallest, simplest step toward change arguing that it was small initial changes in perception, feelings, or behavior that would lead to new life circumstances.

Gleick (1987) noted that sensitive dependence on initial conditions had a place in folklore:

"For want of a nail, the shoe was lost;
For want of a shoe the horse was lost;
For want of a horse, etc."

The point being that a chain of events can have a point of crisis that can magnify small changes. This introduces the idea of turbulence.

Turbulence

Turbulence is a mess of disorder at all scales (Gleick, 1987) it is unstable, highly dissipative, draining energy and creating drag. It is motion turned random. Examples of turbulence are frequent in nature. A plume of smoke rises from an extinguished candle flame accelerates to a critical velocity and splinters into wild eddies. A stream of water flows smoothly around a large rock . Rains come and the stream flows faster until the smooth flow unravels into regions of choppy, swirling water. Chronbach (1988) noted that turbulence has analogies in human affairs such as the escalating

tensions which derail a marriage or the breakdown of discipline in a school.

Turbulence has implications for the conditions that bring clients to therapy. Prochaska and DiClemente (1982) stated that people seek help when they reach a state of existential-developmental crisis. Ivey (1986) made a similar observation stating that perhaps most clients come to therapy and counseling with lives that are messy and disorganized. Their development has been stymied. It is as if the developmental path (not unlike the smooth water or plume of smoke) has broken into swirling eddies.

Budman and Gurman (1988) consider that a significant question for the client is "why now?". Of all possible moments, why did the person chose this particular time to seek help. Entrance into therapy is thus not a random event, but usually occurs in the context of the complex interpersonal and developmental changes within and around an individual. The analogy to chaos is that therapy may begin in the process of the movement from smooth to turbulent flow.

Strange Attractors

In phase space, all that is known about the state of a dynamical system at a single moment can be collapsed to a point. That point is the system at that moment. That system at another moment will be at another point. By charting the points the system can be revealed as it changes and moves through time. Phase space is composed of as many variables as needed to describe a system's movement. The chaos pattern or strange attractor is the shape of the map that results. The term strange is utilized as no two maps are ever exactly alike. Points that become foci are basins of attraction which can be analogous to stones rolling down hills and collecting in basins and valleys as they go. Identification of these attractors and basins would seem to describe environments needing change. The strange attractor underlies seemingly random and chaotic behavior.

Briggs and Peat (1989) describe the movement from order to chaos as analogous to animals that have been caged all their lives. Released, most tend at first to move in a restricted way, not venturing too far. A slightly more adventurous animal may break

from this pattern, discover a whole new universe to explore and go in an entirely unpredictable direction. Nature's systems will often undergo rigid, repetitive movements and then at a critical point evolve radical new behavior. Phase space maps help to clarify this new behavior. Attractors are regions of phase space which exert a magnetic appeal for the system attracting it. Disorder is channeled into patterns with some common underlying theme (Gleick, 1987).

Iteration

Iteration is the simple repeating of a certain function using the previous output as input for the next operation, a feedback loop. A behaviorally handicapped child who spends the school day in suspension misses reading instruction time. The child then reads poorly, becomes more disruptive and is sent to suspension again, thus falling further behind in reading. This is an example of functional iteration (Davis, 1991). The behavior is now compounded by an additional problem . In mathematical language multiplying a term by itself (suspension by suspension) produces nonlinearity and thus opportunity for rich chaotic behavior (Briggs & Peat, 1989). Thus in the example above, we cannot predict the child's ultimate outcome.

Change is integral to the process of therapy. Talmon (1990) noted the natural process of change and the fact that inevitable change is already well underway when therapists first meet their clients. This is opposed to the notion of the client being in a steady state or stuck at the same spot. Ivey (1986) discussed the environment provided by the therapist that supplies the dialectical (movement oriented) framework important to client growth and change. The following case presentation will be used to illustrate the metaphors that chaos may provide for the process of counseling.

Case Presentation

The client is a 6th grade Caucasian male student who was referred to a university out reach counseling service which meets evenings in cooperation with a local school. His counselor was a

practicum student, male, 30 years old. The referral was for exposing himself in school and for using bad language. "Jamie" came to counseling with both parents who did not join in the session but chose to wait outside. The father is a long distance trucker (this was the only contact) and the mother is a full time homemaker. Jamie had been to counseling before and talked of a wide range of topics from basketball to the Alabama football team. He had spoken to the school counselor and explained that a girl is "making everything up". The counselor described Jamie as easy to talk to, "a nice little boy", but rather confused and looking for direction.

During the next two sessions the counselor concentrated on building trust. Sessions were characterized by talk of sports. Jamie had a collection of caps with the logos of various NFL teams and was interested in the progress of a favorite team. The counselor again described Jamie as a confused little boy and focused on helping him to understand that if he did expose himself, that mistakes do happen and he is not a bad person as a result. Jamie was uncommunicative and silent at times which the counselor accepted. Jamie stated that everything at home and school was fine.

Talking with Jamie's mother and the school principal before the third session revealed a different picture. According to the principal, the reason for the original referral was fact and Jamie had been implicated in a couple of fights but had not been caught directly. The mother admitted that Jamie was currently "banned" from a local shopping mall for shoplifting a number of caps. The police had also recently caught him spray painting graffiti on a local street. The mother had negotiated in both instances and Jamie escaped further legal involvement.

In the next session the counselor confronted Jamie about the behavior. After this session the counselor reported that barriers had fallen down and Jamie was "telling the truth about major issues". The mother reported that she was monitoring his behavior at home and that it had improved.

The following week the counselor arrived at the outreach center after Jamie had been the focus of a full day's work for the school principal. Jamie had apparently brought a knife to school to get back

at other students who were "picking on him". This had resulted in threats, parent calls to the principal and Jamie's suspension for a week. The other students showed up at the school prior to the evening counseling to "get him" but were apprehended. The mother sat in on the counseling session and stated that she was "at wit's end" concerning what to do about Jamie's behavior.

The counselor determined that Jamie had developed a "shell" around himself and when confronted will hide in this shell. He could draw tears very easily and this process was labeled "turtling". Confronted with issues he stops talking. He gets into trouble on a regular basis but relies on the appearance of vulnerability to get out of it. Mom usually assists by negotiating the outside consequences. Dad is frequently gone but offered to take Jamie on a trucking trip during the time of the suspension.

The counselor met with Jamie for one more session following the suspension. The counselor told Jamie that he was aware of how he operated and focused on trying to have Jamie talk about his feelings and how they related to his actions. The mother reported that the family was in the process of having Jamie attend a private parochial school that was noted for its structure and discipline. It would not be possible after all that had happened for Jamie to get "fair treatment" at the current school.

The counselor noted after terminating that Jamie is a very confused little boy, yet for a 6th grader he is capable of most anything. He has two sides. One side is the cute little boy that Mom sees, the other side is a rather dark one that involves knives and stealing. Jamie knows how to play both roles. He can draw tears on command and will stop communication when confronted with a difficult subject. He needs to continue counseling.

Discussion

Looking at this case it may seem that few changes had taken place during the course of counseling. The counselor described Jamie as "a confused little boy" at both the beginning and end of the counseling sessions. He was in perhaps more school trouble at the end than at the beginning, and was even considering a different

placement. Parenting was following a familiar course. However, using chaos as metaphor, more order may exist than is readily apparent.

The initial conditions that Jamie brought to the counseling setting could be described as turbulent. The flow,so to speak, of his experience was accelerating. There was trouble at school and in the community. At home his parents were struggling within themselves, with the community, and the school to adapt their parenting to the demands of Jamie's development and behavior. His counselor was juggling demands of establishing a relationship, dealing with the referral, and also with performance as a counseling student. Jamie was not perhaps stuck in ineffective behavioral patterns but caught up in a turbulent environment. The stage for unpredictability was set.

As the sessions progressed "strange attractors" appeared. One could be the "turtling" response that became a predictable reaction to any stress. Another could then be the typical reaction of identification with and even sympathy for the "nice little boy". Parental attractors seemed to be the avoidance of directly dealing with the serious behaviors. Again and again, the parents saw to it that outside consequences were minimized and in a sense even these became rewarding. A trip on Dad's truck during the time of the school suspension, viewed as a way of providing some guidance, was a major "treat" in Jamie's eyes.

The notion of iterative behavior can be descriptive of what happened between sessions four and five. The counselor assumed that progress was being made. Jamie seemed to be communicating genuinely, displaying some trust, and making suggestions for changes. Mom had reported some concrete changes in supervision at home. However, iteratively, behavior feeds upon itself and becomes unpredictable. Gleick (1987) noted that a stable mathematical solution exists for standing a pencil on its point, however in reality the slightest perturbation pulls the system away and the pencil topples. Chaotic phenomena make Jamie's behavior (the knife incident) prior to the fifth session "predictable". We may need to view seeming "chaotic" behavior not as a failure of the the

counseling process but as part of a process that may have no inherently predictable outcomes.

Implications

Chaos can relate to the process of therapy. Chaotic systems are robust and chaos and stability exist together (Gleick, 1987). The property of creative change is part of this robustness. Clients come to therapy with a set of initial conditions. Change then may not occur in a process that is smooth and steady but in "sudden jumps from state to state". Iterative processes then serve to regulate and control by imposing a nonlinear dynamic whereby the system tends to return to the starting point. Strange attractors become points around which the system may revolve. These notions seem to be echoed by Ivey (1986) who commented on the change process in therapy stating that each searches the environment "randomly" yet, paradoxically, systematically for change.

Therapists from particularly a brief model (Budman & Gurman, 1988; Prochaska & DiClemente,1982; Talmon ,1990) have established the importance of the conditions initiating therapy, the "why now". Talmon considers the process of even the phone call to schedule the first session as containing the seeds of change. Budman and Gurman advocate utilizing the initial conditions such as novelty and surprize in the new setting as therapeutic leverage and that the person has entered therapy as suggesting a "maximal availability for change". The initial conditions set events in motion. Motion takes place around basins of attraction where,in the notions of chaos, creative outcomes are produced.

The concerns and life situations that clients present when they enter therapy are a unique and generally complex set of life circumstances. Counselors are interested in assisting this unique individual in the process of growth and change. Chaos theory, although itself complex, provides an intriguing opportunity to explore the process of change in counseling from a perspective that incorporates the notion that behavior may be irregular, sometimes unpredictable, yet be part of an explainable whole. In viewing outcomes as basically beyond accurate prediction counselors can be

heartened. Nonlinearity means that the act of playing the game has a way of changing the rules (Gleick, 1987).

References

Briggs, J. & Peat, F.D. (1989). *Turbulent mirror: An illustrated guide to chaos theory and the science of wholeness.* New York: Harper and Row.

Budman, S. & Gurman, A.S. (1988). *Theory and practice of brief therapy.* New York Guilford Press.

Chronbach, L.J. (1988). Playing with chaos. *The Educational Researcher, 17,* 46-49.

Cziko, G.a. (1989). Unpredictability and indeterminism in human behavior: Arguments and implications for educational research. *Educational Researcher, 18,* 17-25.

Davis-Seaver, E.J. (1991) Nonlinear dynamics in an educational setting. Paper presented at the annual meeting of the Eastern Educational Research Association, Boston: MA.

Gleick, J. (1987). *Chaos: Making a new science.* New York: Viking Penguin.

Ivey, A.E. (1986). *Developmental therapy: Theory into practice.* San Francisco. Jossey-Bass.

Lindsay, J.S. (1991). The "chaos" pattern in Piaget's theory of cognitive development. Paper presented at the annual meeting of the Eastern Educational Research Association, Boston: MA.

Prochaska, J.O., & DiClemente, C. D. (1982). Transtheoretical therapy: Toward a more integrative model of change. *Psychotherapy: Theory, Research, and Practice, 19,* 276-288.

Sechrest, L, Ametrano, D., & Ametrano, I.M. (1983). Evaluations of social programs. In C. E. Walker (Ed.), *The handbook of clinical psychology: Theory, research and practice,Volume I* (pp. 129-169). Homewood, IL: Dow Jones-Irwin.

Talmon, M. (1990). *Single session therapy.* San Francisco: Jossey-Bass.